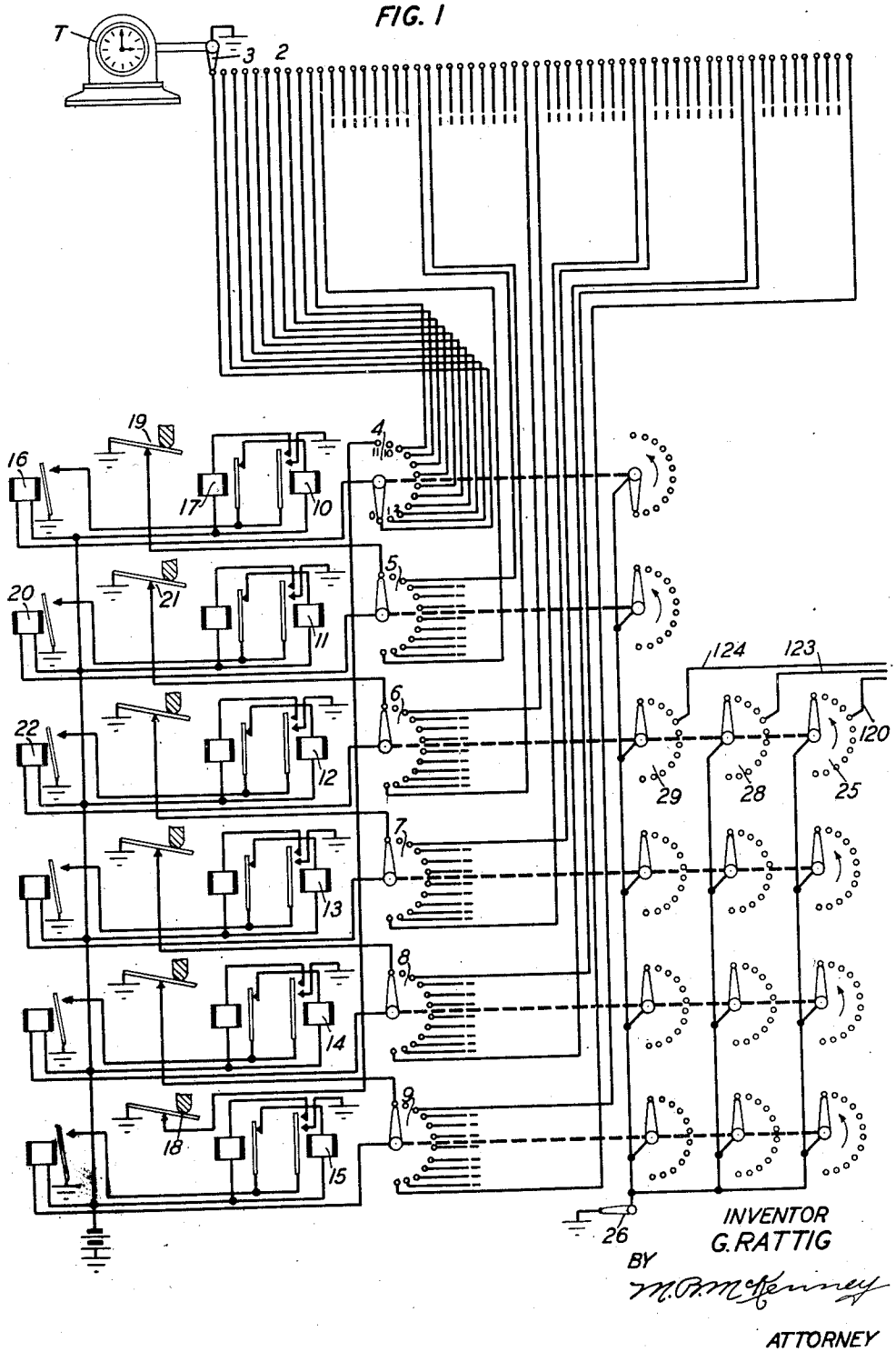
Nov. 29, 1932. G. RÄTTIG 1,889,108

TIME ANNOUNCING SYSTEM

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FIG. 1

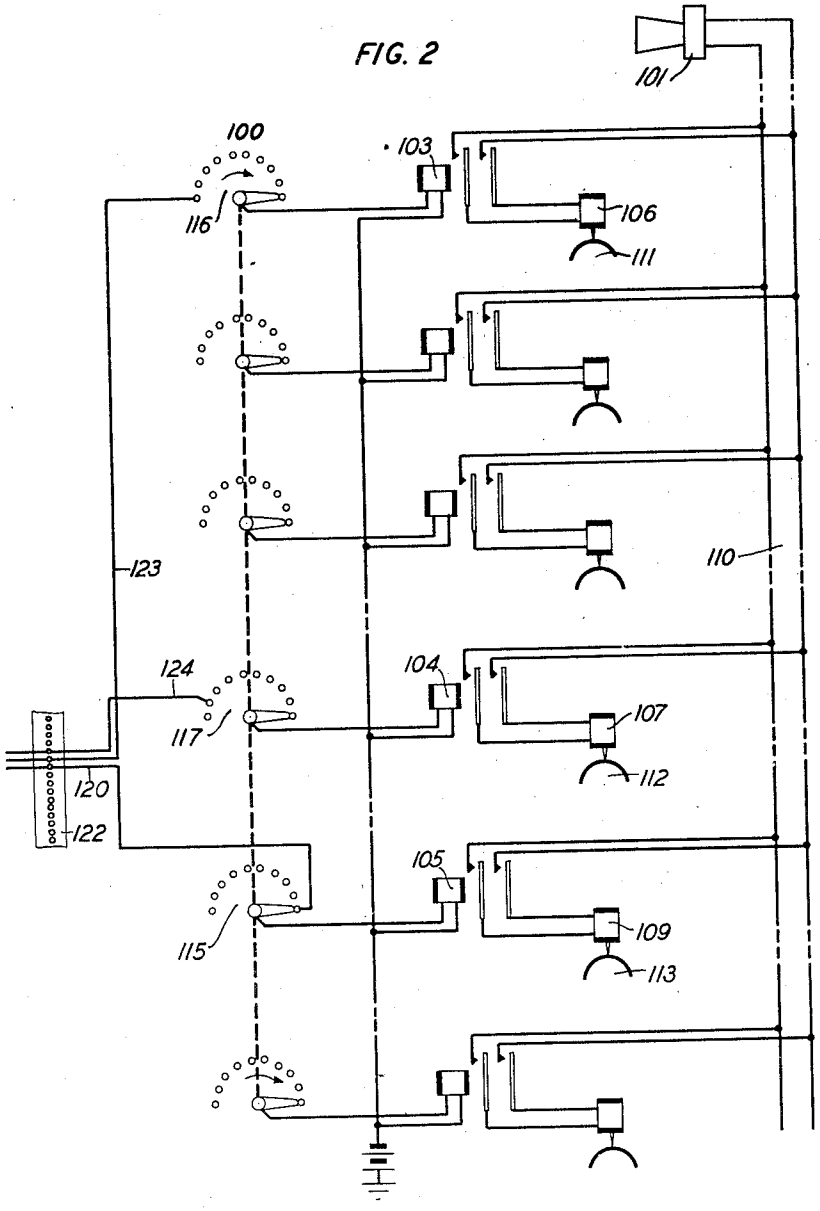


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FIG. 2



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UNITED STATES PATENT OFFICE

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TIME ANNOUNCING SYSTEM

Application filed July 14, 1931, Serial No. 550,714, and in Germany March 6, 1930.

This invention relates to time announcing systems and particularly to circuit arrangements for controlling the selection of the time announcements to be made from time to time.

An object of the invention is to simplify means for selecting the time announcements comprising combinations of word elements.

Heretofore, time announcing systems have been proposed for announcing, at periodically recurring intervals, the time of day, by connecting phonographic means in the form of films or phonograph discs to an announcing circuit.

The present invention relates to a circuit arrangement for systems of this type whereby certain combinations of word elements announcing the time of day may be selected from phonographic means and transmitted to an announcing device. A feature of the invention is a series of step-by-step selectors controlled by a timing device to periodically select recording devices and connect said devices in succession to an announcing means, such as a transmitter or telephone circuit to give the correct time of day expressed in word elements.

Another feature of this system is a circuit arrangement in which in case the current supply for the selectors is momentarily cut off, the timing device will control the selectors to advance to their proper positions to select the corresponding time announcement when the current is again applied.

Another feature of the invention is a circuit arrangement in which the selectors employed may be of any well known standard step-by-step type.

The invention has been illustrated in the accompanying drawings in connection with a system for announcing in succession the minutes of an hour. In Fig. 1 the timing device and a series of selector switches have been shown for selecting the announcement to be made each succeeding minute and in Fig. 2 a series of selectors have been shown for controlling the announcing in accordance with the selections made by the selectors in Fig. 1 and recording devices for transmitting the selected announcements.

The system represented in these figures has been shown in diagrammatic form and with only sufficient circuit connections indicated to give a clear conception of the system as a whole. It should be understood that this system may be equally well applied to announce other word element combinations such as, for example, the hour of the day or any other desirable periodically recurring announcement.

Referring now to the drawings, in Fig. 1 is shown a time controlled contact device 2 having a wiper 3 that travels over 60 contacts at the rate of one contact per minute as controlled by the clock mechanism T. In the case assumed, sixty different announcements are to be made successively and then repeated. There is, therefore, provided six step-by-step switches 4 to 9 controlled by their respective stepping magnets 10 to 15 to be stepped in succession over their respective groups of ten contacts each under control of the contact device 2 and held in their eleventh step until again controlled by the device 2. These step-by-step selectors have as many contact banks as there are separate word elements or numbers to be announced at any position. In this case two of these switches are provided with one additional contact bank and the remaining four with three additional contact banks as the maximum number of word elements will be three. It has been assumed as an example that the announcements will be made in the manner in which corresponding German announcements are made for each minute, for example, if the 27th minute is to be announced, it will be announced as 7 and 20 or as it is spoken in German, sieben und zwanzig. For the first two selectors 4 and 5 only one additional bank is necessary as the first 19 numbers are announced with a single word, one, two, three, etc. to nineteen, or the corresponding German numerals.

In Fig. 2 are shown a number of step-by-step selectors 100 having ten points each and which may be operated continuously by some suitable timing device (not shown) to take three steps per minute so that the maximum of three word elements may be transmitted each minute. These switches control relays such as 103, 104 and 105 to close the connec-

tions from respective reproducing devices such as 106, 107 and 109 to a common pair of conductors 110 that may lead to a receiving device such as a sound current loud speaker or other announcing apparatus 101. These reproducers 106, 107 and 109 and others may operate on discs or recording cylinders that have recorded on them the corresponding word elements, for example, the recording disc 111 associated with the reproducer 106 may have the word element "and" or "und", the disc 112 may have word element "twenty" or "zwanzig", and the disc 113 may have the word element "seven" or "sieben" inscribed therein. These sound current reproducing devices and the discs cooperating therewith may be of any well known type such as those shown in the phonographic time announcing system of the patent to J. G. Blessing, 1,227,523 of May 22, 1917. Sound records and reproducing devices of this general character are also shown in the phonographic call announcing system of the patent to A. E. Lundell 1,277,440 of September 3, 1918. In this patent a call announcing device is employed to announce telephone numerals or other information through a telephone receiver to an operator. In this particular embodiment of the switches 100 there will be one switch bank for each numeral up to 19, and one for each numeral, 20, 30, 40 and 50 and an extra one for the word "and". All of these switches will control, as stated, their individual relays and reproducers for their corresponding word element records. It should be understood that these various step-by-step selectors and contact device 2 may be of any well known construction such as the usual step-by-step switches employed in the automatic telephone art.

A description of the operation of this system will now be made in connection with the successive operation of the switches 4 to 9 and the specific example of announcing the time twenty-seven, or as it is spoken in German sieben und zwanzig. It is assumed that the wiper 3 of the contact device 2 has just been advanced from the zero or sixty minute contact to the first contact, and that the wiper of switch 4 rests on the zero contact. A circuit will now be completed as follows: from battery, winding of relay 16, wiper of switch 4 and the zero contact, the first contact of device 2 and the wiper 3 to ground. If, now, the wiper 3 is advanced to the second contact at the end of the first minute, relay 16 will release. A circuit is thereby closed for the stepping magnet 10 of switch 4 from battery, winding of magnet 10, armature and back contact of relay 17 to ground at the armature and back contact of relay 16. Magnet 10 operates and attracts its armature, and switches the wiper of switch 4 to the first contact position. This magnet also operates its armature to close a circuit for the energization of a relay 17 over a circuit from battery, winding of relay 17 to ground at the armature and front contact of magnet 10. Relay 17 in operating opens the circuit for magnet 10 which is then released. It should be noted, however, that as soon as the wiper of switch 4 has advanced to the first position, a circuit will again be completed for relay 16 from ground on wiper 3 at the second position. The magnet 10 will now remain released due to the opening of the original circuit therefor by relay 16 in energizing. Relay 17 is released as soon as magnet 10 releases. When, now, the wiper 3 advances to the third position, relay 16 will again release and stepping magnet 10 again operates to cause the advance of the wiper of switch 4 to the second position, and to cause the operation of relay 17 which releases the magnet 10 and causes the reoperation of relay 16. These operations are repeated until the wiper of switch 4 has reached the ninth position or the ninth contact when it is advanced to the tenth position. At the tenth position, relay 16 does not find a ground connection, as the tenth terminal is not connected to the device 2 and the magnet 10 is therefore, on the release of relay 17, again permitted to take another step to advance the wiper of switch 4 to the eleventh position. At this position relay 16 finds a ground connection as follows: from the ground at the off-normal contact 18 of switch 9, eleventh terminal of switch 4, wiper of this switch, winding of relay 16 to battery. Relay 16 operates in this position and prevents the magnet 10 from operating further at this time. Switch 4 will now rest in the eleventh position until all the other switches 5 to 9 have operated, when it will again be operated to take a step to bring its wiper in connection with the zero terminal. In the eleventh position of switch 4, the corresponding off-normal contact 19 is opened so that relay 20 of switch 5 which has been held operated by ground from this off-normal contact 19 is now released. This permits a circuit to be closed for the stepping magnet 11 to advance the wiper of switch 5 to the zero position. In this position relay 20 will again be operated from ground on wiper 3 in position 11 to prevent the magnet 11 from taking another step until the wiper 3 has advanced to position 12. When this happens relay 20 releases to step magnet 11 to advance the wiper of switch 5 to the first position. The switch 5 is now stepped in the same manner as switch 4 and when the eleventh position is reached, the corresponding off-normal contact 21 will operate to release relay 22 of switch 6. When the last switch 9 has operated to the eleventh position, the off-normal contact 18 will open the circuit for relay 16 to cause the operation of switch 4 to be repeated. It will, therefore, be seen that the switches 4 to 9

will be stepped around in succession once for every 60 minutes, one step at a time, and while one switch is in operation the remaining five will be held in the eleventh position.

If the battery for the operation of these switches should be temporarily removed, then the switches after the battery is again connected, will successively be actuated to step up into synchronism with the device 2. This is accomplished in the following manner. If relay 16, for example, is deprived of current when the wiper of switch 4 has been stepped to the second position, the switch will step in this position until battery is again connected. When this takes place magnet 10 will again operate to step the switch 4 another step and operate relay 17 which in turn releases the magnet 10. This will continue until the switch has caught up with the wiper 3 when relay 16 will operate and the switch 4 will then be controlled as hereinbefore described to step in synchronism with wiper 3. If the wiper 3 is advanced beyond the first ten steps into the second group of ten contacts before battery is again applied, switch 5 will be automatically advanced until this switch is stepped into synchronism with wiper 3. This system, therefore, always adjusts itself automatically to synchronous operation with the time controlled contact device 2 after the battery has been restored to the circuit.

The announcing of the series of word elements by means of the selectors 100 and the reproducing devices shown in Fig. 2, will now be described with the aid of the example of a time announcement seven and twenty or as it is spoken in German sieben und zwanzig. When the selector 6 has advanced to the seventh position, the circuit connections from the brushes of the terminal banks 25, 28 and 29 of this switch are connected as shown to selectors 115, 116 and 117. In this position circuits will be closed for connecting the reproducers 109, 106 and 107 in succession to the conductors 110 by the operation of relays 105, 103 and 104 in succession, when the brushes of these selectors 115, 116 and 118 are advanced simultaneously from one position to the other. These reproducers will consequently cause sound currents to be produced in the conductors 110 in accordance with the word elements inscribed on the discs 113, 111 and 112. These sound currents will in turn cause corresponding sounds to be produced by the loud speaker 101 connected to the conductors 110. The sound effects in the case assumed consist of the word elements sieben und zwanzig. In the particular position of the switches 100, as shown in Fig. 2, it is assumed that switch 115 makes the first connection to close a circuit for relay 105 from battery, winding of this relay, the brush of switch 115 and its last position terminal, conductor 120 through connecting rack 122 to the seventh position terminal and brush of bank 25, the common switch 26 to ground. Relay 105 in operating closes its contacts to connect the reproducer 109 to the conductors 110 and the word element "sieben" will then be announced by the loud speaker 101. At the next step of the switches 100, switch 116 will close a connection for relay 103 from battery, winding of this relay, brush of switch 118 and the first position terminal to conductor 123, through the connecting rack 122 to the seventh position terminal and brush of bank 28, switch 126 to ground. Relay 103 will then close a connection from reproducer 106 to the conductors 110 to cause the word element "und" to be announced by the loud speaker 101. Similarly, on the next step of the switches 100, the switch 117 will have its brush on the second position terminal and thereby close a similar circuit for the operation of relay 104 from battery, winding of this relay, the brush and the second terminal of bank 117, conductor 124 through connecting rack 122 to the seventh terminal and brush of bank 29 through switch 26 to ground. Relay 104 in operating closes a connection for the reproducer 107 to conductors 110 to cause the word element "zwanzig" to be announced by the loud speaker 101. As the switches 100 proceed new combinations will be set up to cause succeeding combinations of word elements to be announced. During the next minute the word elements "acht und zwanzig" will be announced in succession and each succeeding announcement will therefore represent an elapsed minute.

What is claimed is:

1. In an announcing system, a clock controlled contact device, a plurality of step-by-step selectors, means controllable by said contact device for operating said selectors for a number of steps each in succession, sound current reproducing means, a transmitting circuit, means for connecting said reproducing means to said transmitting circuit, and means operable in response to the operation of said selectors for controlling said connecting means to operate periodically.

2. In an announcing system, a clock controlled contact device, a plurality of step-by-step selectors, means controllable by said contact device for operating said selectors for a number of steps each in succession, and periodically, sound current reproducing means, a transmitting circuit, means for connecting said reproducing means to said transmitting circuit, and means operable in response to the operation of said selectors for controlling said connecting means to operate periodically.

3. In an announcing system, a clock controlled contact device, a plurality of step by-step selectors, means controllable by said contact device for operating said selectors for a number of steps each in succession and periodically, sound current reproducing means,

a transmitting circuit, means for connecting said reproducing means to said transmitting circuit and means operable in response to the operation of said selectors for controlling said connecting means to operate once for each step of each of said selectors.

4. In an announcing system, a clock controlled contact device, a plurality of step-by-step selectors, means controlled by said contact device for operating said selectors for a number of steps each in succession, sound current reproducing means, a transmitting circuit, relays for connecting corresponding reproducing means to said sound transmitting circuit, other step-by-step selectors and circuit means therefor effective in response to operations of said first mentioned selectors for actuating said relays.

5. In an announcing system, a clock controlled contact device, a plurality of step-by-step selectors, means controlled by said contact device for operating said selectors for a number of steps each in succession, sound current reproducing means, a transmitting circuit, relays for connecting corresponding reproducing means to said transmitting circuit, other step-by-step selectors and circuit means therefor effective in response to operations of said first mentioned selectors for actuating said relays in successive combinations.

6. In an announcing system, a clock controlled contact device, a plurality of step-by-step selectors, means controlled by said contact device for operating said selectors for a number of steps each in succession, sound current reproducing means, a transmitting circuit, relays for connecting corresponding reproducing means to said transmitting circuit, other step-by-step selectors and circuit means therefor effective in response to operations of said first mentioned selectors for actuating said relays in successive combinations repeatedly.

7. In an announcing system, a clock controlled contact device, a plurality of step-by-step selectors, means controlled by said contact device for operating said selectors for a number of steps each in succession, sound current reproducing means, a transmitting circuit, relays for connecting corresponding reproducing means to said transmitting circuit, other step-by-step selectors and circuit means therefor effective in response to operations of said first mentioned selectors for actuating said relays in successive combinations, one relay at the time and one combination of relays for each step of each of the first mentioned selectors.

In witness whereof, I hereunto subscribe my name, this 12th day of June, 1931.

GERHARD RÄTTIG.